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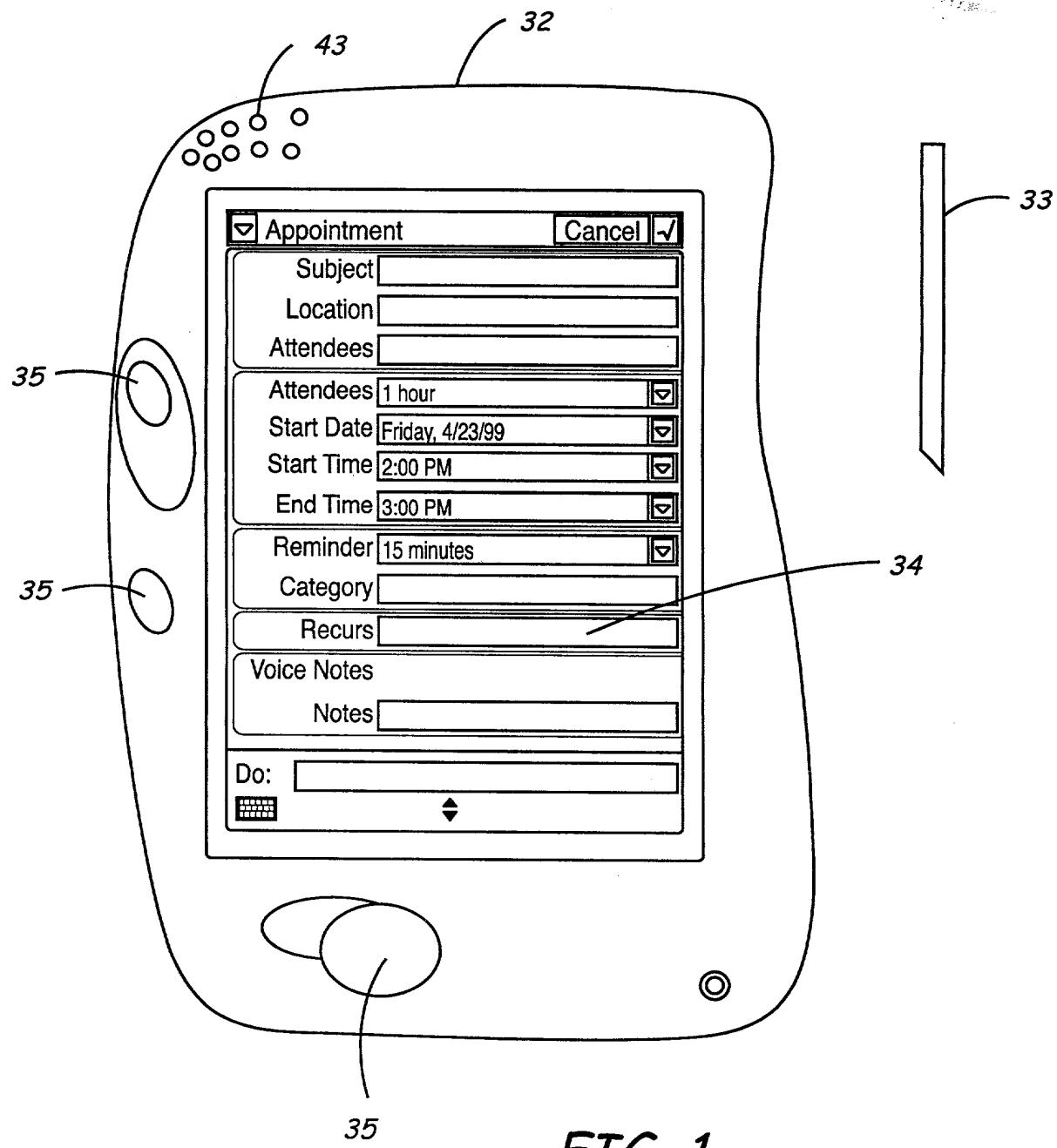


FIG. 1

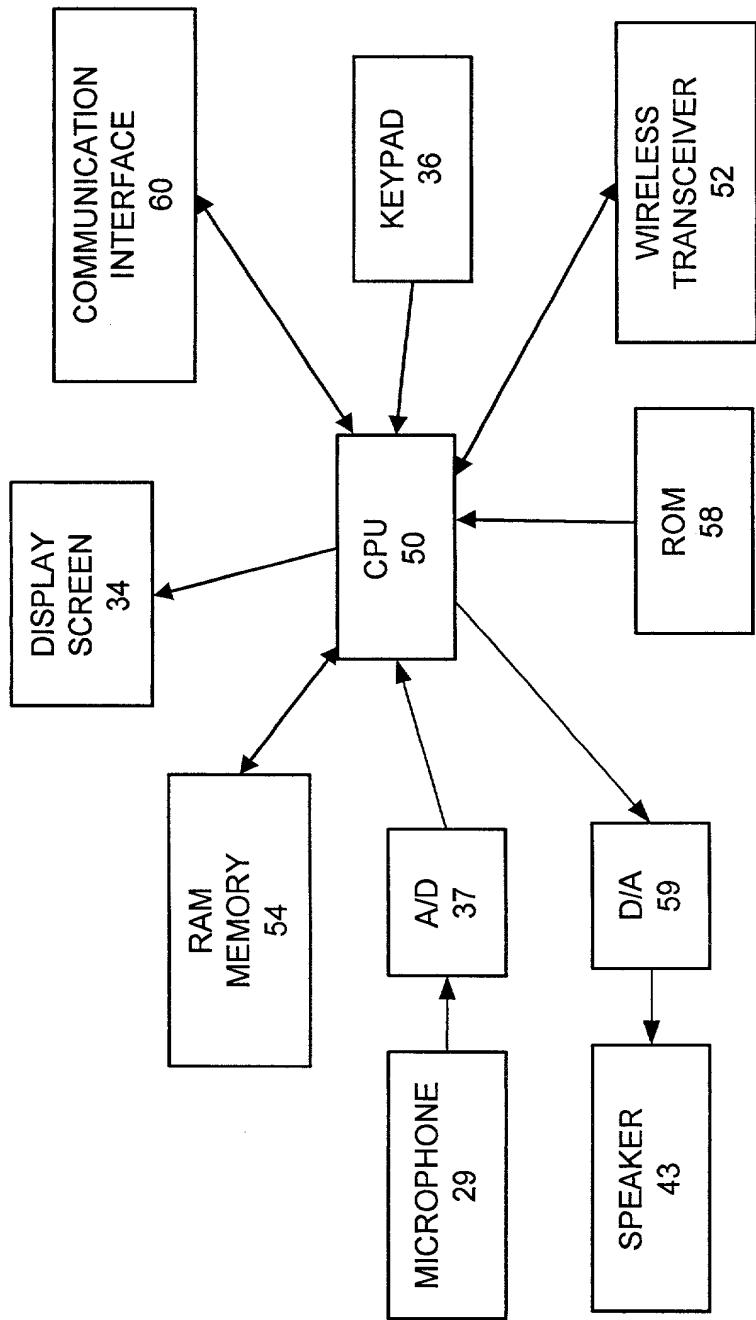
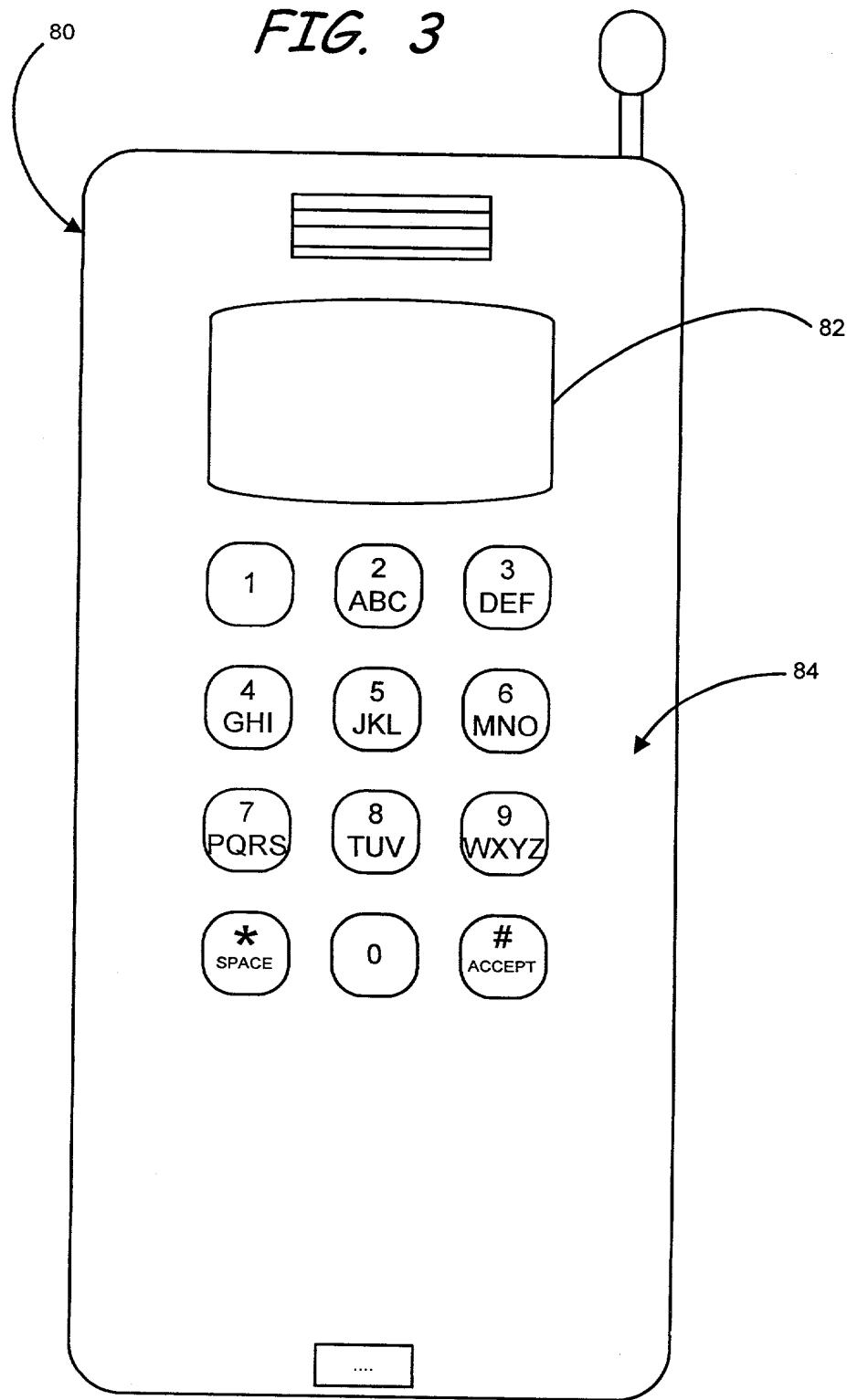


FIG.2

FIG. 3



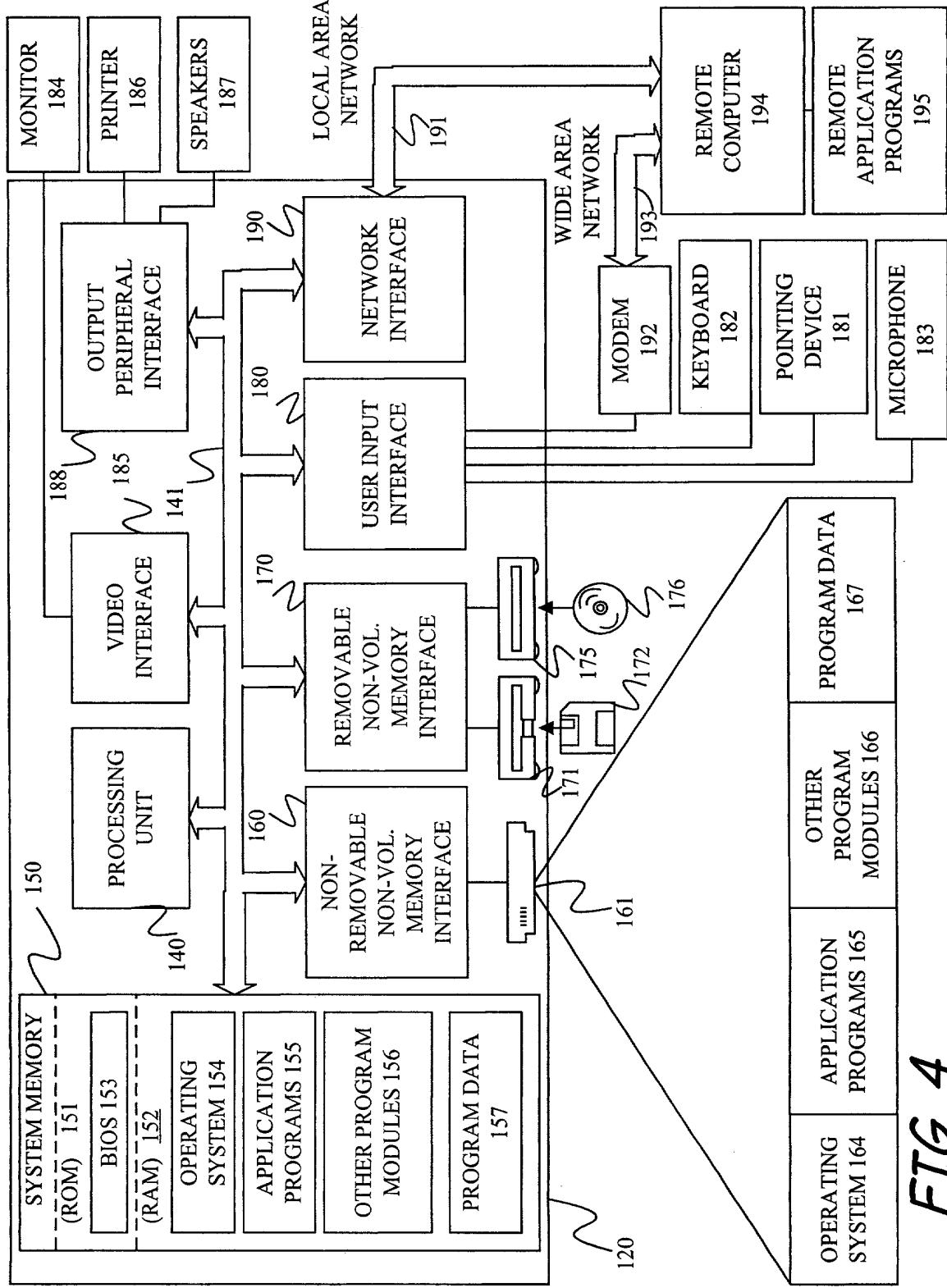
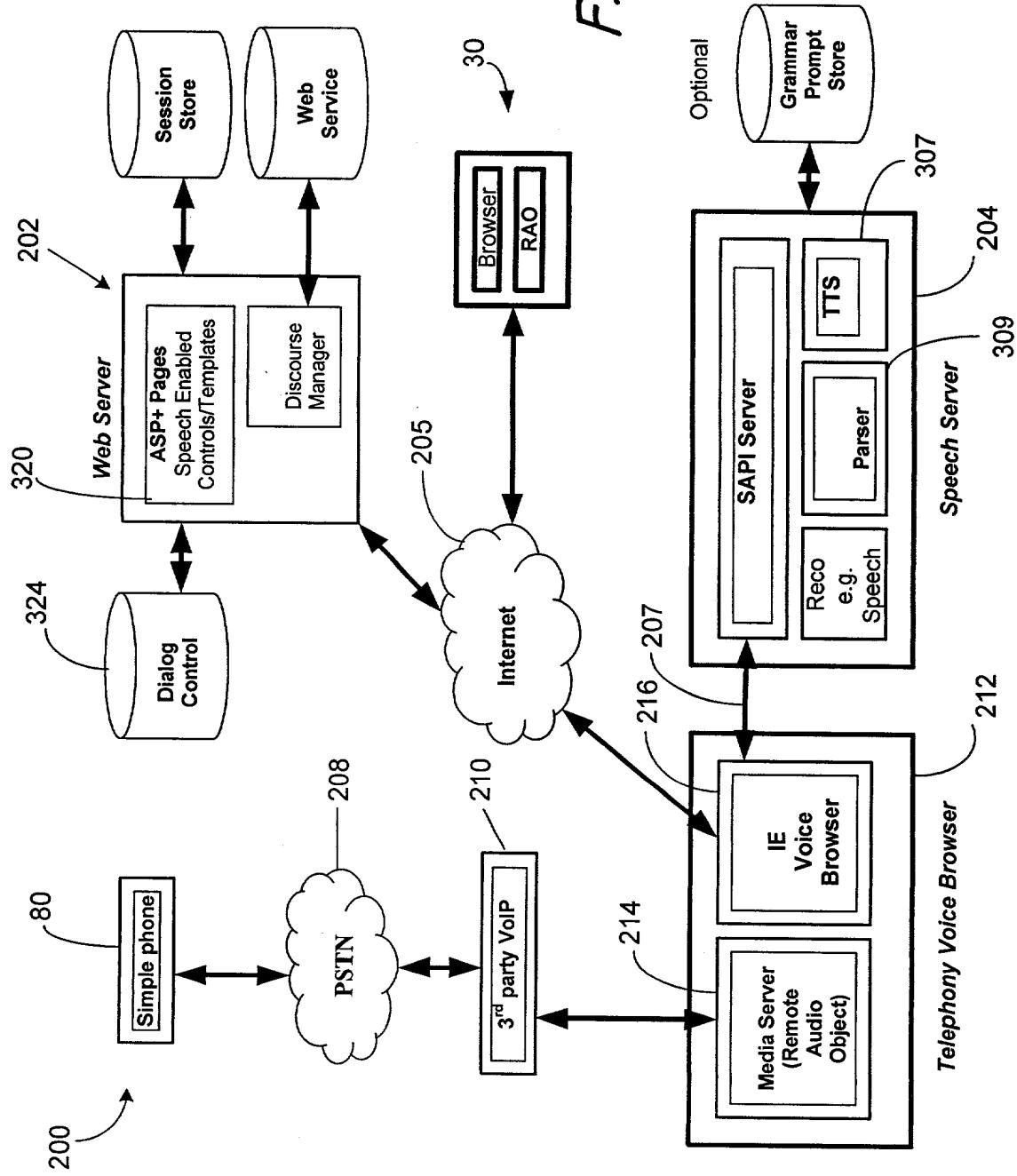


FIG. 4

FIG. 5



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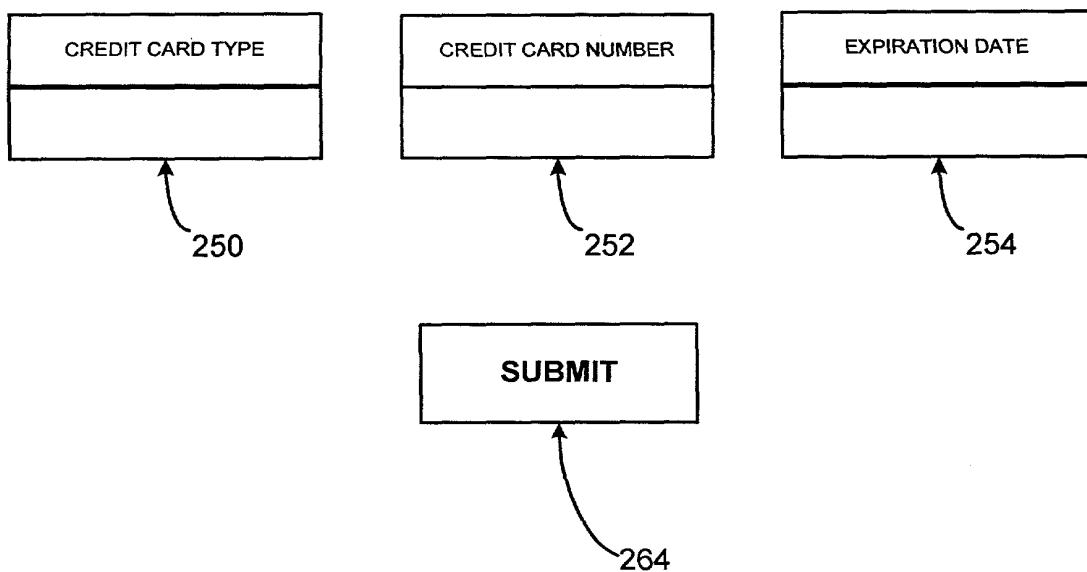


FIG. 6

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```
<html>
  <form id="get_card_info" method="post" action="http://payment.asp">
    <select name="card_type">
      <option value="amex">American Express</option>
      <option value="visa">Visa</option>
      <option value="mastercard">MasterCard</option>
    </select>
    <input type="text" name="card_num" width="30"
      onChange="handle()" />
    <input type="text" name="expiry_date" />
    <input type="submit" value="Submit" onClick="verify()" />
  </form>
  <script><![CDATA[
    function handle() {
      if (get_card_info.card_type.value == "amex") {
        if (get_card_info.card_num.length != 15)
          alert ("amex should have 15 digits");
      } else
        if (get_card_info.card_num.length != 16)
          alert ("visa and master should have 16 digits");
    }
    function verify() {
      var flag = window.confirm("submit the credit card info?");
      if (flag)
        get_card_info.submit();
    }
  ]]>
</script>
</html>
```

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FIG. 7

```

270   <html>
      <form id="get_card_info" method="post" action="http://payment.asp">
        <select name="card_type" onClick="talk(g_card_types)">
          <option value="amex"> American Express</option>
          <option value="visa"> Visa</option>
          <option value="ms"> MasterCard</option>
        </select>
        <reco id="g_card_types" onReco = "handle()" >
          < grammar src=".//gram#card_types" />
        </reco >
        <input type="text" name="card_num" width="30"
               onClick="talk(g_card_num)" />
        <reco id=" g_card_num " onReco = "handle()" >
          < grammar src=".//gram#digits" />
        </reco >
        <input type="text" name="expiry_date"
               onClick="talk(g_expiry_date)" />
        <reco id="g_expiry_date " >
          < grammar src = " .//gram#dates " />
        </reco >
        <input type="submit" value="Submit" onClick="verify()" />
      </form>
      <script><![CDATA[
        function talk(gobj) {
          gobj.activate();
        }
        function handle() {
          if (get_card_info.card_num != null) {
            if (get_card_info.card_type.value == "amex") {
              if (get_card_info.card_num.length != 15)
                alert ("amex should have 15 digits");
            } else
              if (get_card_info.card_num.length != 16)
                alert ("visa and master should have 16 digits");
            }
          }
        function verify() {
          var flag = window.confirm("submit the credit card
info?");
          if (flag) {
            get_card_info.submit();
          }
        }
      ]]>
    </script>
  </html>

```

FIG. 8

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```
< body >
  < form id = " get_card_info " method = " post " action = " http://payment.asp "
    onActivate = " welcom() " >
    < prompt id = " p_welcome "> We now need your credit card </ prompt >
    < prompt id = " p_mumble "> I didn't understand you </ prompt >
    < prompt id = " p_card_type " bargein = " true "> What credit card would you
  use? </ prompt >
    < prompt id = " p_card_num " bargein = " true "> Please say the number </ prompt >
    < prompt id = " p_expiry_date " bargein = " true "> What is the expiration
  date? </ prompt >
  < prompt id = " p_content ">
    I have your < value select = " card_type " /> < value select = " card_num " />
    with expiration date
    < value select = " expiry_date " />
  </ prompt >
  < prompt id = " p_confirm "> Is this correct? </ prompt >
  < reco id = " g_card_types " onNoReco = " mumble(this, 2) " >
  onReco = " _handle(this, card_type) " />
  < grammar src = " ./gram#card_types " >
  </reco >
  < reco id = " g_card_num " onNoReco = " mumble(this, 1) " >
  onReco = " _handle(this, card_num) " />
  < grammar src = " ./gram#digits " />
  </reco >
  < reco id = " g_expiry_date " onNoReco = " mumble(this, 1) " >
  onReco = " _handle(this, expiry_date) " audio = " rao " />
  < grammar src = " ./gram#dates " />
  </reco >
  < reco id = " confirmation " onReco = " confirmed(this) " />
  < grammar src = " ./gram#yesno " />
  </reco >
  < select name = " card_type " >
    < option value = " amex "> American Express </ option >
    < option value = " visa "> Visa </ option >
    < option value = " ms "> MasterCard </ option >
  </ select >
  < input type = " text " name = " card_num " width = " 30 " />
  < input type = " text " name = " expiry_date " />
  < input type = " submit " value = " Submit " />
</ form >
< script ><![CDATA[
  function welcom() {
    p_welcome.active();
    repeat = 0;
    checkFilled();
  }
  function mumble(gobj, maxprompts) {
    gobj.deactivate();
    p_mumble.active();
    checkFilled();
  }
  </script >
```

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TO FIG. 9B

FIG. 9A

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```
function _handle() {
    handle();
    checkFilled();
}

function checkFilled() {
    if (card_type.value == "") {
        p_card_type.active();
        g_card_types.activate(); return;
    }
    if (card_num.value == "") {
        p_card_num.active(); g_card_num.activate(); return;
    }
    if (expiry_date.value == "") {
        p_expiry_date.active(); g_expiry_date.activate(); return;
    }
    p_content.activate();
    p_confirm.activate();
    confirmation.activate();
}

function confirmed(gobj) {
    if (gobj.recogRes.text == "yes")
        get_card_info.submit();
}

// user codes start here
function handle() {

    if (get_card_info.card_type == "amex") {
        if (get_card_info.card_num.length != 15) {
            prompt.speak ("amex should have 15 digits");
            get_card_info.card_num = "";
        }
    } else
        if (get_card_info.card_num.length != 16) {
            prompt.speak ('visa and master should have 16 digits');
            get_card_info.card_num = "";
        }
    }
}]]>
</script>
</body>
```

FIG. 9B

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```
<body>
  <form id="get_card_info" method="post" action="http://payment.asp"
  onactivate="welcome()">
    <prompt id="p_welcome">We now need your credit card</prompt>
    <prompt id="p_mumble">I didn't understand you</prompt>
    <prompt id="p_card_type" bargein="true">What credit card would you
  use?</prompt>
    <prompt id="p_card_num" bargein="true">Please say the number</prompt>
    <prompt id="p_expiry_date" bargein="true">What is the expiration
  date?</prompt>
    <prompt id="p_content">
      I have your <value select="card_type" /><value select="card_num" />
      with expiration date <value select="expiry_date" />
    </prompt>
    <prompt id="p_confirm">Is this correct?</prompt>
    <reco id="g_get_card_info" onReco="_handle()" onNoReco ="mumble(this)">
      <grammar src ="./gram/getPayment" />
      <bind target="card_type" value="/card/type" />
      <bind target="card_num" value="/card/number" />
      <bind target="expiry_date" value="/card/expr_date" />
    </reco>
    <reco id="confirmation" onReco ="confirmed(this)" onNoReco="mumble(this)" />
      <grammar src ="./gram#yesno"/>
    </reco>
    <select name="card_type">
      <option value="amex">American Express</option>
      <option value="visa">Visa</option>
      <option value="ms">MasterCard</option>
    </select>
    <input type="text" name="card_num" width="30" />
    <input type="text" name="expiry_date" />
    <input type="submit" value="Submit" />
  </form>
  <script><![CDATA[
    function welcome() {
      p_welcome.active();
      repeat = 0;
      checkFilled();
    }
    function mumble(gobj) {
      gobj.deactivate();
      p_mumble.active();
      checkFilled();
    }
    function _handle() {
      handle();
      checkFilled();
    }
  ]]></script>
```

FIG. 10A

TO FIG. 10B

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```
function checkFilled() {
    if (card_type.value == "") {
        p_card_type.active(); do_field.activate(); return;
    }
    if (card_num.value == "") {
        p_card_num.active(); do_field.activate(); return;
    }
    if (expiry_date.value == "") {
        p_expiry_data.active(); do_field.activate(); return;
    }
    p_content.activate();
    p_confirm.activate();
    confirmation.activate();
}
function confirmed(gobj) {
    if (gobj.recogRes.text == "yes")
        get_card_info.submit(gensml());
}
// user codes start here
// function handle() {
if (field == get_card_info.card_num) {
    if (get_card_info.card_num.length != 15) {
        prompt.speak ("amex should have 15 digits");
        get_card_info.card_num = "";
    }
} else
    if (get_card_info.card_num.length != 16) {
        prompt.speak ("visa should have 15 digits");
        get_card_info.card_num = "";
    }
}
function gensml() {
    str = '<sml><credit_card type=""';
    str += card_type.value; str += '><number>';
    str += card_number.value; str += '</number><expire>';
    str += expiry_date.value; str +=
'</expire></credit_card></sml>';
    return str;
}
]]>
</script>
</body>
```

FIG. 10B

SAMPLE ASP+ PAGE

```

<%@ Page language="Jscript" AutoEventWireup="false" Inherits="Credit.Transaction" %>
<html><head>
<!-- ASPX page for both voice-only &amp; multimodal credit card example --&gt;
&lt;script&gt;
function handle() {
    if (field == get_card_info.card_num) {
        if (get_card_info.card_num.length != 15) {
            prompt.speak ("amex should have 15 digits");
            get_card_info.card_num = "";
        }
    } else
        if (get_card_info.card_num.length != 16) {
            prompt.speak ("visa should have 15 digits");
            get_card_info.card_num = "";
        }
    }
function gensml() {
    str = '&lt;sml&gt;&lt;credit_card&gt;&lt;card_type&gt;';
    str += card_type.value; str += '&lt;/card_type&gt;&lt;number&gt;';
    str += card_number.value; str += '&lt;/number&gt;&lt;expire&gt;';
    str += expiry_date.value; str += '&lt;/expire&gt;&lt;/credit_card&gt;&lt;/sml&gt;';
    return str;
}
&lt;/script&gt;
&lt;script runat="server"&gt;
function Page_Load (obj, args) {
    if (PostBack) {
        validator = new System.Speech.SMLValidator("./CreditSDL.xml");
        dsml = validator.Evaluate(args);
        Navigate(ChoosePage(dsml));
    } else {
        // initialize fields with args
    }
}
&lt;/script&gt;
&lt;/head&gt;
&lt;body&gt;
&lt;speech:form id="get_card_info" style="system_initiative"
    prompt=".//prompt/getPayment" onsubmit="gensml()"&gt;
    &lt;speech:choice name="card_type" prompt="What credit card would you use?"&gt;
        grammar=".//gram#card_types" onPhraseFinish="handle()"
        &lt;option&gt;American Express&lt;/option&gt;
        &lt;option&gt;Visa&lt;/option&gt;
        &lt;option&gt;Mastercard &lt;/option&gt;
    &lt;/speech:choice&gt;
    &lt;speech:textbox name="card_number" prompt="Please say the number"
        grammar=".//gram#digits" onPhraseFinish="handle()"/&gt;
    &lt;speech:textbox name="expiry_date" prompt="What is the expiration date? "
        grammar=".//gram#dates" onPhraseFinish="handle()"/&gt;
&lt;/speech:form&gt;
&lt;/body&gt;
&lt;/html&gt;
</pre>

```

FIG. 12

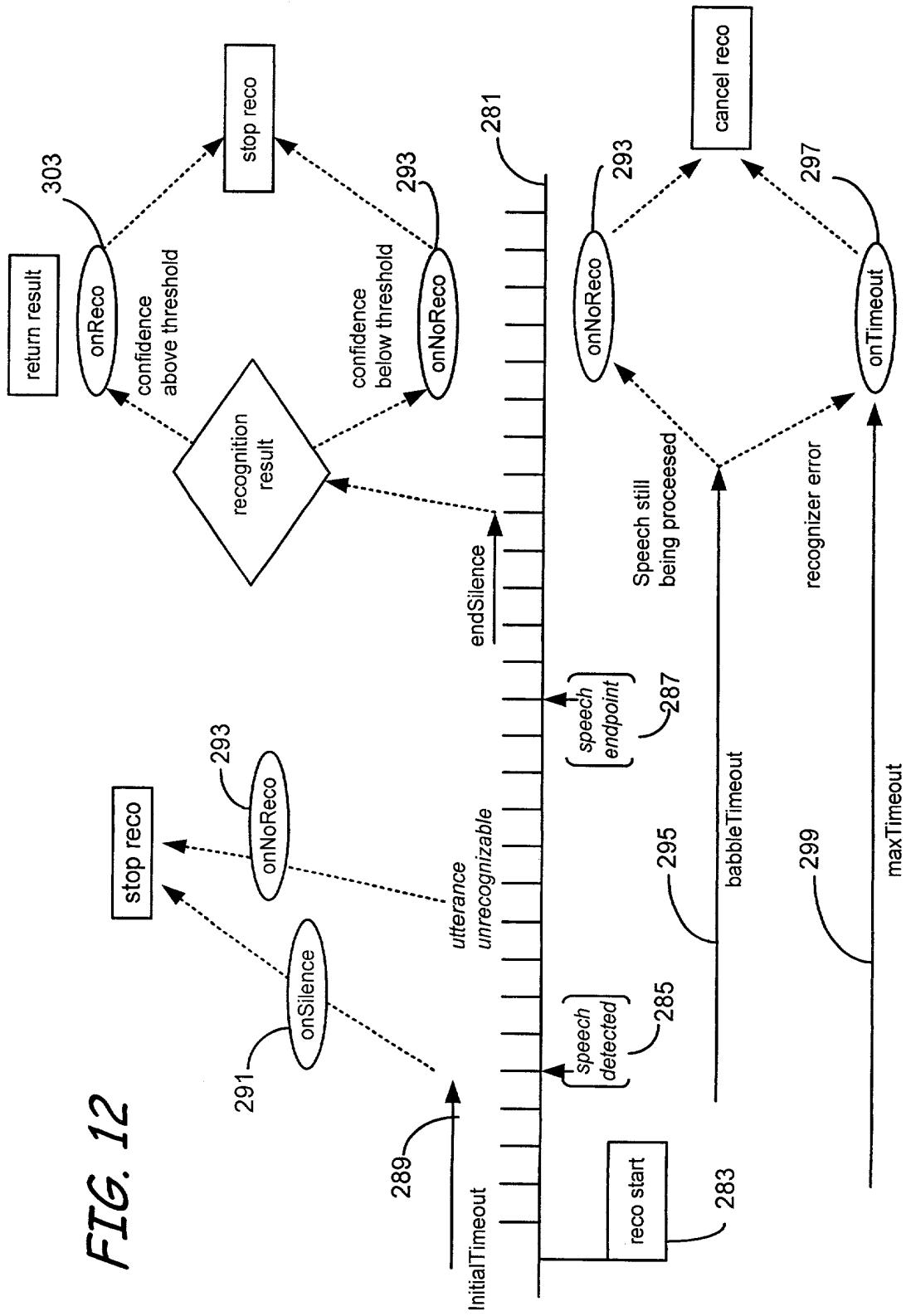


FIG. 13

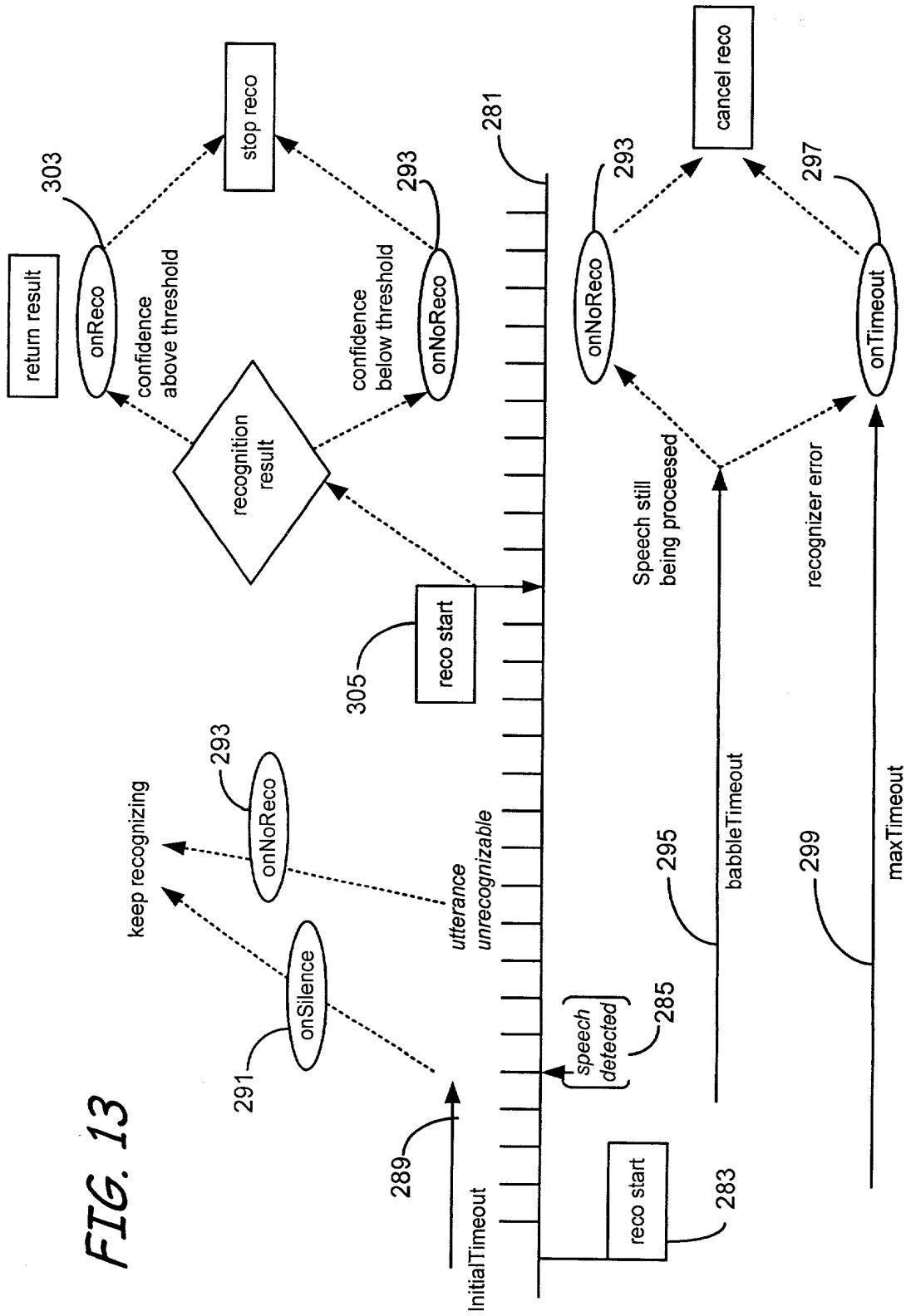


FIG. 14

